UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,694	10/27/2003	Seung Min Lee	0465-1068P	2071

2292 7590 02/22/2005

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
WHITTINGTON, KENNETH	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/692,694	LEE ET AL.	
	Examiner	Art Unit	
	Kenneth J Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 5-13* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

in paragraph 8, line 2, "in" should be inserted between "current" and "every"

in paragraph 0081, line 3, some phrase should follow "one thousand times", otherwise it is unclear the relationship between the magnetic field and this phrase.

Appropriate correction is required.

Abstract

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because on line 1, it includes terms that can be implied, i.e., "Disclosed". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are the element that enables the sensor unit to combine the magnetic field from a second feedback coil with the output of the SQUID signal. The magnetic field from the second feedback coil must be received in some element in some manner and converted into a signal before it can be combined with the output signal of the SQUID sensor. There is no recitation of any elements that are capable performing such act, thus, the claims are missing this essential feature.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 5-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Keene et al. (US 6,339,328). Regarding claim 1, Keene et al. discloses a SQUID apparatus comprising a SQUID sensing unit with a feedback coil (See Keene et al. FIG. 5, items 25b, 26b, 30a and 30b and see col. 6, lines 15-22), an auxiliary sensor arrangement (See FIG. 5, items 25a and 26a, col. 3, lines 9-12 and col. 6, lines 15-22, note that Keene et al. contemplates an arrangement wherein a fluxgate is the auxiliary sensor), and a sensor reading unit for operating the SQUID and the auxiliary sensor to read out a signal of the SQUID and supplying the SQUID with feedback through a feed back coil (See FIG. 5, items 31, 32, and the ASPA discussed in col. 7, line 66 to col. 8, line 67).

Regarding claim 2, Keene et al. further discloses a driving unit for the SQUID (See FIG. 5, items 27b and 28b) and a driving unit for the auxiliary sensor (See FIG. 5, items 27a and 28a)

and a first combining unit to combine the signals generated by the SQUID driver and the auxiliary sensor to supply the SQUID with an offset signal (See FIG. 5, item 31).

Claim 5, as best understood in light of the above 112 rejection, is interpreted to mean that the sensor reading unit combines the signal from the auxiliary sensor and the SQUID sensor, applies this signal to the feedback coil, the SQUID sensor detects this combined signal, the sensor reading unit again combines this combined signal with the auxiliary signal which is again applied to the feedback coil and so forth. Keene et al. discloses such features in FIG. 5.

Regarding claim 6, Keene et al. discloses the sensor reading unit combining the signal representative of the magnetic field by the auxiliary sensor with a signal of the SQUID sensor and applying the combined signal to the feedback loop (See Keene et al. FIG. 5, items, 31, 32, 30a and 30b).

Regarding claim 7, Keene et al. discloses a second combiner for combining an output of the auxiliary sensor and the SQUID sensor having noise removed (See Keene et al. col. 7, line 66 to col. 8, line 67, note ASPA as combiner).

Regarding claims 8 and 9, Keene et al. discloses the second combiner allowing the signals from the SQUID and auxiliary sensors in a predetermined ratio to eliminate the noise in the

signal. (See col. 7, line 66 to col. 8, line 67). Furthermore, since the signals in Keen et al. are combined in the noted ratio and Keene et al. has the recited structure of the claims, then the ratio of Keene et al. is representative of the product of the output value of the SQUID, the combination constant and the gain of the SQUID driver.

Regarding claim 10, Keene et al. discloses the auxiliary sensor being a pick-up coil, i.e., a fluxgate sensor. (See Keene et al. col. 3, lines 9-12).

Regarding claim 11, Keene et al. discloses a refrigerator for maintaining the SQUID sensor at a low temperature (See Keene et al. col. 11, line 66 to col. 12, line 10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for

establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keene et al in view of Sata (US 5,343,707). Keene et al. teaches all the limitations of claims 1 and 11 as discussed above. However, while Keene et al. teach using the sensor arrangement in a SQUID apparatus, it does not disclose features of the apparatus. Sata teaches a motor unit, a coolant for the compressor device and a cold end (See FIG. 3 and col. 7, line 1 to col. 8, line 65), and the SQUID being disposed away from the motor unit (See FIG. 3, item 31). It would have been obvious to incorporate the components as taught by Sata in the sensor arrangement of Keene et al. One having ordinary skill in the art would have been motivated to do so to provide the means for maintaining the SQUID sensor at low temperatures in a manner known in the art. It is also noted that since Keene et al. teaches an axial configuration for its sensors (See Keene et al. col. 6, lines 23-32), if in such an

axial position, the SQUID sensor would be nearer the object to be tested while the auxiliary sensor would be axially away form the object to be tested and nearer the motor assembly.

Allowable Subject Matter

Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: while the prior art discloses various reset methods and reset signals to prevent error in the SQUID or to protect the SQUID from excessive noise (See US 5,331,278, US 5,162, or US 5,254,950), the prior art does not disclose the auxiliary unit receiving such reset values to also protect the SQUID value from a noise generated from an auxiliary sensor, in combination with the other features of the claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koch (US 5,122,744) and Geisler (US 4,823,081) each disclose SQUID or magnetometer apparatus wherein a secondary or auxiliary sensor

is used to provide a background signal via a feedback coil to the primary sensor. Note that Geisler also discloses combining the signal from the primary and secondary sensors, which is sent to the feedback coil. Kandori et al. (US 6,462,540) and Mallick (US 5,187,436) teach auxiliary sensors to a SQUID sensor located remote from the SQUID, the signal therefrom being subtracted from the SQUID signal. Wellstood et al. (US 5,894,220) discloses general features of a SQUID apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kenneth J Whittington
Examiner
Art Unit 2862

kjw

JAY PATIDAR
PRIMARY EXAMINER